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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/539,987	06/17/2005	Ayumi Senda	075834.00453	8307

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EXAMINER

AU, BACH

ART UNIT PAPER NUMBER

2822

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/539,987

Applicant(s)

SENDA, AYUMI

Examiner

Bac H. Au

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 17 June 2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 3-4, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams (U.S. Pat. 5523628).

Regarding claims 1, 3-4, and 6-7, Williams [Figs.4-10] discloses a semiconductor-device production method wherein, before a semiconductor chip [20] having a plurality of bumps [24] is mounted on a mount substrate [28; col.1 lines 25-28] having a plurality of bumps [26] by flip chip bonding, projecting guides [22] are formed on at least one of the semiconductor chip and the mount substrate so as to protrude near the bumps and from a surface on which the bumps are provided, and to have guide faces pointing toward the bumps;

wherein the projecting guides [22] are provided near the bumps disposed at four corners on the outermost periphery of the semiconductor chip or the mount substrate;

wherein the projecting guides are made of a material that becomes harder than the bumps at a heating temperature during bump bonding [Since the bumps (made of indium) are bonded by cold welding (col.3 line 64 – col.4 line 1), the guide material is

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inherently harder than the bump material in order for it to protect the bumps from damage];

wherein the projecting guides [22] are formed so that the height thereof is larger than the height of the bumps [24] disposed near the projecting guides [Col.3 lines 40-49];

wherein the projecting guides are formed so that the height thereof is substantially equal to or smaller than a prescribed gap between the semiconductor chip and the mount substrate [Fig.7];

Regarding claim 8, Williams [Figs.4-7] discloses a semiconductor device wherein a semiconductor chip [20] having a plurality of bumps [24] is mounted on a mount substrate [28; col.1 lines 25-28] having a plurality of bumps [26] by flip chip bonding, and wherein projecting guides [22] are provided on at least one of the semiconductor chip and the mount substrate so as to protrude near the bumps and from a surface on which the bumps are provided, and to have guide faces pointing toward the bumps.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Larnerd (U.S. Pat. 3811186).

Regarding claim 1, Larnerd [Figs.1-5] discloses a semiconductor-device production method wherein, before a semiconductor chip [12] having a plurality of

bumps [14] is mounted on a mount substrate [10] having a plurality of bumps [15] by flip chip bonding, projecting guides [22] are formed on at least one of the semiconductor chip and the mount substrate so as to protrude near the bumps and from a surface on which the bumps are provided, and to have guide faces pointing toward the bumps.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larnerd (U.S. Pat. 3811186) in view of Seiji (JP5145224).

Regarding claim 2, Larnerd [Col.2 lines 24-36] discloses wherein the guides can be of various shape and sizes, but fails to explicitly disclose wherein the guide faces of the projecting guides are inclined faces or curved faces disposed along oblique lines at an obtuse angle to the surface on which the bumps are provided. However, Seiji [Fig.2] discloses wherein the guide faces [2a] of the projecting guides [2] are inclined faces or curved faces disposed along oblique lines at an obtuse angle to the surface on which the bumps [4] are provided.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Seiji into the method of Larnerd to include wherein the guide faces of the projecting guides are inclined faces or curved

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faces disposed along oblique lines at an obtuse angle to the surface on which the bumps are provided. The ordinary artisan would have been motivated to modify Larnerd in the manner set forth above for at least the purpose of providing the guides with the desired shape and size such that the components are held in place for accurate bonding [Larnerd; col.2 lines 33-36].

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Larnerd (U.S. Pat. 3811186) in view of Ikuo (JP3270030).

Regarding claim 5, Larnerd [Col.2 lines 24-36] discloses wherein the guides can be of various shape and sizes, but fails to explicitly disclose wherein the projecting guides are provided near the bumps so as to be substantially L-shaped in plan view. However, Ikuo [Fig.8] discloses wherein the projecting guides [5B] are provided near the bumps so as to be substantially L-shaped in plan view.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Ikuo into the method of Larnerd to include wherein the projecting guides are provided near the bumps so as to be substantially L-shaped in plan view. The ordinary artisan would have been motivated to modify Larnerd in the manner set forth above for at least the purpose of providing the guides with the desired shape and size to maintain alignment of the components for accurate bonding [Larnerd; col.6 lines 15-25].

Conclusion


5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bac H. Au whose telephone number is 571-272-8795. The examiner can normally be reached on Mon-Fri 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BHA


Zandra V. Smith
Supervisory Patent Examiner
7. Jan 2007